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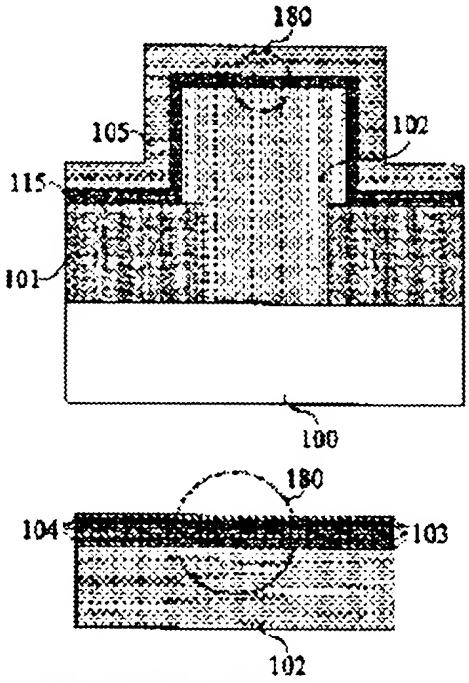
(54) CAPACITOR COMPRISING ALUMINA/ALUMINUM NITRIDE COMPOSITE DIELECTRIC FILM FORMED BY ATOMIC LAYER VAPOR-DEPOSITION METHOD, AND ITS MANUFACTURE

(57)Abstract:
PROBLEM TO BE SOLVED: To trigger no chemical reaction even when a conductive polysilicon is used as a lower part electrode in succession in a semiconductor DRAM process, by forming a composite dielectric film comprising an alumina layer and an aluminum nitride layer on the upper part of a conductive layer with a pattern by an atomic layer vapor-deposition method.
SOLUTION: A silicon oxide film 101 is formed on a semiconductor substrate 100 first, and a storage polysilicon 102 is formed as a lower part electrode constituting a charge storage capacitor, over which an alumina 103 is formed by an atomic layer vapor-deposition method. Being amorphous, the alumina film is excellent in step coverage, almost to 100%. Then the alumina layer 103 and an aluminum nitride layer 104 are repeatedly formed by the atomic layer vapor-deposition method in situ, forming an Al2O3/AlN composite dielectric thin film 115, over which a doped polysilicon is vapor-deposited to form the upper part electrode of a DRAM capacitor.



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